Chapter 3 – The Science Content Standards
Introduction to Middle School Science Education (Grades 6-8)

In each of the six years of instruction in grades K-5, the California Science Standards cover the three content areas of science in approximately equal measures. . In the three middle grades, however, the standards call for individual areas of focus in science, an organization that permits students to probe the field of science to greater depths. The sixth grade content standards focus on earth science, seventh on life sciences, and eighth on physical science. These standards are intended to prepare students for the more formal treatment of concepts, principles, and theories called for at the high school level. Students commonly take a Biology or Life Sciences course early in high school, and the eighth grade focus on physical science is partly designed to provide these students with a solid foundation in physics and chemistry. Since seventh grade students typically have a semester of health education, the seventh grade focus on life sciences is meant to complement that instruction. Finally, sixth grade is a time when students often become environmentally aware, and the focus on earth science in that year is meant to stimulate their intellectual curiosities.

Not all students will enter middle school prepared for the rigorous science curriculum called for in the middle grades standards. It is important that teachers use "catch up" strategies to ensure that students are ready for high school science. One of the key requirements is for students to have foundational reading and mathematics skills, as outlined in the State Board of Education Curriculum Frameworks for Reading-Language Arts and Mathematics. These frameworks provide specific strategies for teachers to help students who are below grade level in reading and mathematics.

Students who reach grade level Mathematics Content Standards for California Public Schools in the eighth grade will have all the tools they need for success in high school science. Those that do not will struggle and may even fail in their science classes to the great frustration of their teachers, parents, and guardians. For example, students who have not learned to work with arithmetic and algebra will find chemistry difficult, if not impossible. Science instruction should provide opportunities for students to use mathematics through solving problems. Teachers may use science to both reinforce mathematical abilities as well as deepen students' understanding of key mathematical concepts.

Safety is always a first consideration in the design of demonstrations, hands-on activities, laboratories and science projects, on site or away from school. Teachers should be familiar with the Science Safety Handbook for California Public Schools (1999). It contains specific and useful information relevant to classroom teachers of science. Observing and promoting safe practices is a legal and moral obligation for administrators, teachers, parents, and students. Safety should be taught. Scientists and engineers in universities and industries are required to follow strict environmental health and safety regulations. Knowing and following safe practices in science is part of understanding the nature of science and scientific enterprise.